



US007892627B2

(12) **United States Patent**
Doughty

(10) **Patent No.:** **US 7,892,627 B2**
(45) **Date of Patent:** **Feb. 22, 2011**

(54) **PATTERN TRANSFERABLE TO SKIN FOR
OPTICAL MEASUREMENTS DURING
SHAVING**

(75) Inventor: **Darrell Gene Doughty**, Cincinnati, OH
(US)

(73) Assignee: **The Gillette Company**, Boston, MA
(US)

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 92 days.

(21) Appl. No.: **12/436,864**

(22) Filed: **May 7, 2009**

(65) **Prior Publication Data**

US 2009/0240167 A1 Sep. 24, 2009

Related U.S. Application Data

(63) Continuation of application No. 11/656,654, filed on
Jan. 23, 2007, now abandoned.

(51) **Int. Cl.**

B41M 5/00 (2006.01)

B44C 1/17 (2006.01)

G03G 7/00 (2006.01)

A61B 5/00 (2006.01)

A61B 5/103 (2006.01)

A61B 5/117 (2006.01)

(52) **U.S. Cl.** **428/195.1; 600/306; 600/587**

(58) **Field of Classification Search** 428/195.1,
428/211.1, 409, 914; 600/306, 552, 553,
600/557, 562, 570, 587, 595; 30/32-84,
30/526-541

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,118,014 A 11/1914 Jennings

(Continued)

FOREIGN PATENT DOCUMENTS

DE 196 13 978 10/1997

(Continued)

OTHER PUBLICATIONS

Tyson, Schmidt and Galanulis, "Optical Deformation & Strain Measurement in Biomechanics", Biophotonics, pp. 1-7 Sep. 2003.

(Continued)

Primary Examiner—Mark Ruthkosky

Assistant Examiner—David J Joy

(74) *Attorney, Agent, or Firm*—John M. Lipchitz; Kevin C. Johnson; Steven W. Miller

(57) **ABSTRACT**

A system for measuring 3D deformation and strain on the skin of a living person. A non contact optical 3D deformation measuring system is provided having a plurality of high resolution digital cameras for measuring 3D coordinates and 3D deformations operatively connected to a computer. A removable tattoo is also provided including a substrate and a pattern having a plurality of indicia distributed to form a pattern density of between about 40% and about 60%. The removable tattoo provides a reference marking for the non contact optical 3D deformation measuring system.

13 Claims, 21 Drawing Sheets

